

## CLAIMS

What is claimed is:

- 1     1.     An apparatus for retrieving Permanent Virtual Channel (PVC) configuration  
2           information from a network device coupled to the apparatus, wherein the PVC  
3           configuration information specifies one or more PVCs defined for the network  
4           device, the apparatus comprising:  
5           a PVC configuration parameter storage means having a first input for receiving the  
6                 PVC configuration information, the PVC configuration parameter storage  
7                 means for storing at least a portion of said PVC configuration information  
8                 and providing a portion of said PVC configuration information at an output;  
9           request generator means for generating and providing to an output at least one  
10           request for PVC configuration information for at least one logical interface,  
11           wherein each PVC is uniquely identified by a Virtual Path Identifier (VPI)  
12           and a Virtual Channel Identifier (VCI), the request generator means being  
13           configured to:  
14                 if the VPI and VCI for a particular PVC are known, generate an ILMI  
15                     getrequest command that includes the known VPI and VCI for the  
16                     particular PVC, and  
17                 if the VPI and VCI for a particular PVC are not known, generate an ILMI getnext  
18                     command that includes a specified VPI and a specified VCI that indicate  
19                     that the VPI and VCI for a particular PVC are not known;  
20           a network protocol adapter means having an input coupled to the request generator  
21           means output for receiving the at least one request for PVC configuration

information and providing at an input/output logically configured into the at least one logical interface and coupled to the network device at least one message responsive to the at least one request for PVC configuration information, and for receiving at the first input/output at least one message from the network device and generating and providing at an output, on the network protocol adaptor means, at least one message comprising the PVC configuration information responsive to at least one of the messages from the network device received at the network protocol adaptor means input/output;

a response receiver means having

first input coupled to the network protocol adaptor means output for receiving the PVC configuration information from the network protocol adaptor means;

a first output coupled to the PVC configuration parameter storage means input;

a second output coupled to the request generator means,

second input operatively coupled to receive an indicator responsive to an interruption in transmission between the apparatus and the network device;

a deleter means having an input coupled to the second input of the response receiver means and an output coupled to the first output of the response receiver means;

wherein the response receiver means is configured to provide to the first output of the response receiver means at least a portion of the PVC configuration information received at the response receiver means first input in response to

45 an identifier contained in the message received at the response receiver  
46 means first input from the network protocol adaptor means;  
47 wherein the response receiver means is further configured to extract VPIs and VCIs  
48 from the PVC configuration information and provide the VPIs and VCIs to  
49 the request generator means to be used by the request generator means to  
50 generate subsequent ILMI requests;  
51 wherein the response receiver means is further configured to generate identification  
52 data that indicates that the at least a portion of the PVC configuration  
53 information was received from the network device; and  
54 wherein the deleter means is configured to cause, based upon the identification data  
55 and receipt of the indicator at the input of the deleter means, the at least a  
56 portion of the PVC configuration information to be selectively deleted from  
57 the PVC configuration parameter storage means.

1 2. The apparatus of Claim 1, wherein the network protocol adapter means comprises a  
2 segmenter and reassembler means having a first input/output coupled to the input of  
3 the network protocol adapter means for receiving at least one of the requests for PVC  
4 configuration information and to the output of the network protocol adapter means,  
5 the segmenter and reassembler means for:  
6 generating and providing at a second input/output coupled to the network protocol  
7 adapter means input/output at least one ATM cell responsive to at least one of  
8 the requests for PVC configuration information received at the segmenter and  
9 reassembler means first input/output;-and

10 receiving at the second input/output at least one of the messages received from the  
11 network device and providing at the first input/output coupled to the network  
12 protocol adapter means output at least one message responsive to at least one  
13 of said messages received from the network device.

1 3. The apparatus of claim 2, wherein the network protocol adapter means additionally  
2 comprises a message protocol adapter means for:  
3 receiving at an input coupled to the request generator means output at least one of the  
4 requests for PVC configuration information from the request generator means  
5 and providing at first input/output coupled to the segmenter and reassembler  
6 first input/output at least one SNMP command responsive to at least one of  
7 said requests for PVC configuration information; and  
8 receiving at a second input/output coupled to the segmenter and reassembler second  
9 input/output at least one message responsive to at least one of the messages  
10 received from the network device and providing at an output at least a portion  
11 of the PVC configuration information of said message.

1 4. The apparatus of claim 1, wherein the request generator means has an input  
2 operatively couple to receive a status message and wherein the ILMI getnext  
3 command is responsive to the status message.

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1 5. The apparatus of claim 1, wherein at least one set of the VPIs and VCIs received  
2 at the response receiver first input comprise an SNMP trap

1     6.     An apparatus for retrieving Permanent Virtual Circuit (PVC) configuration  
2           information from a network device in a communications network, wherein the  
3           PVC configuration information specifies one or more PVCs defined for the  
4           network device, the apparatus comprising:  
5           a request generator configured to generate and provide to the network device  
6           a request for PVC configuration information stored in the network device;  
7           a physical interface logically configured into a logical main interface and a  
8                     plurality of logical sub-interfaces, the physical interface being configured  
9                     to receive a message containing both the PVC configuration information  
10                    stored in the network device and a Virtual Path Identifier (VPI); wherein  
11                    the VPI and a VCI uniquely identify a PVC associated with the PVC  
12                    configuration information;  
13           a comparator configured to compare the VPI from the message to a first  
14                     logical sub-interface number of a first logical sub-interface from the  
15                     plurality of logical sub-interfaces; and  
16           if the VPI from the message matches the first logical sub-interface number of the  
17                     first logical sub-interface, then cause the PVC configuration information  
18                     from the message to be selectively stored into a first portion of a PVC  
19                     configuration information storage that is designated for the first logical  
20                     sub-interface; and  
21           if the VPI from the message does not match the first logical sub-interface number  
22                     of the first logical sub-interface, then cause the PVC configuration

23 information from the message to be selectively stored into a second  
24 portion of the PVC configuration information storage that is designated for  
25 the logical main interface.

1 7. The apparatus as recited in Claim 6, wherein the comparator is further configured  
2 to if the VPI from the message does not match the first logical sub-interface  
3 number of the first logical sub-interface, then  
4 compare the VPI from the message to a second logical sub-interface number of a  
5 second logical sub-interface from the plurality of logical sub-interfaces;  
6 and  
7 if the VPI from the message matches the second logical sub-interface number of  
8 the second logical sub-interface, then cause the PVC configuration  
9 information from the message to be selectively stored into a second  
10 portion of the PVC configuration information storage that is designated for  
11 the second logical sub-interface.

1 8. The apparatus as recited in Claim 6, wherein:  
2 the request generator is further configured to generate and provide to the network  
3 device a second request for PVC configuration information stored in the  
4 network device;  
5 the physical interface is further configured to receive a second message  
6 containing both updated PVC configuration information stored in the  
7 network device and the VPI;

8           the comparator is further configured to  
9           compare the VPI from the second message to the first logical sub-interface  
10          number of the first logical sub-interface from the plurality of logical sub-  
11          interfaces; and  
12          if the VPI from the second message matches the first logical sub-interface number  
13               of the first logical sub-interface, then cause the updated PVC  
14               configuration information from the second message to be selectively  
15               stored into the first portion of a PVC configuration information storage  
16               that is designated for the first logical sub-interface in a manner that  
17               indicates that the updated PVC configuration information is the most  
18               recent PVC configuration information for the first logical sub-interface  
19               received from the network device.

1    9.     The apparatus as recited in Claim 6, wherein the request generator is further  
2           configured to:  
3           format the request for PVC configuration information stored in the network  
4               device into a request in a first format for PVC configuration information  
5               stored in the network device; and  
6           segment the request in the first format into a plurality of formatted request  
7               segments.

1    10.    The apparatus as recited in Claim 9, wherein the first format is SNMP.

- 1 11. The apparatus as recited in Claim 9, wherein the first format is AAL5.
- 1 12. The apparatus as recited in Claim 9, wherein at least one of the plurality of  
2 formatted request segments comprises an ATM cell.
- 1 13. The apparatus as recited in Claim 6, wherein the request includes an ILMI  
2 getrequest command in SNMP format.
- 1 14. The apparatus as recited in Claim 6, wherein the request includes an ILMI getnext  
2 command in SNMP format
- 1 15. An apparatus for retrieving Permanent Virtual Circuit (PVC) configuration  
2 information from a network device in a communications network, wherein the  
3 PVC configuration information specifies one or more PVCs defined for the  
4 network device, the apparatus comprising:  
5 a request generator means configured to generate and provide to the network  
6 device a request for PVC configuration information stored in the network  
7 device;  
8 a physical interface means logically configured into a logical main interface and a  
9 plurality of logical sub-interfaces, the physical interface means being  
10 configured to receive a message containing both the PVC configuration  
11 information stored in the network device and a Virtual Path Identifier



12 (VPI), wherein the VPI and a VCI uniquely identify a PVC associated  
13 with the PVC configuration information;  
14 a comparator means configured to compare the VPI from the message to a first  
15 logical sub-interface number of a first logical sub-interface from the  
16 plurality of logical sub-interfaces; and  
17 if the VPI from the message matches the first logical sub-interface number of the  
18 first logical sub-interface, then cause the PVC configuration information  
19 from the message to be selectively stored into a first portion of a PVC  
20 configuration information storage means that is designated for the first  
21 logical sub-interface; and  
22 if the VPI from the message does not match the first logical sub-interface number  
23 of the first logical sub-interface, then cause the PVC configuration  
24 information from the message to be selectively stored into a second  
25 portion of the PVC configuration information storage means that is  
26 designated for the logical main interface means.

1 16. The apparatus as recited in Claim 15, wherein the comparator means is further  
2 configured to if the VPI from the message does not match the first logical sub-  
3 interface number of the first logical sub-interface, then  
4 compare the VPI from the message to a second logical sub-interface number of a  
5 second logical sub-interface from the plurality of logical sub-interfaces;  
6 and

7 if the VPI from the message matches the second logical sub-interface number of  
8 the second logical sub-interface, then cause the PVC configuration  
9 information from the message to be selectively stored into a second  
10 portion of the PVC configuration information storage means that is  
11 designated for the second logical sub-interface.

1 17. The apparatus as recited in Claim 15, wherein:

2 the request generator means is further configured to generate and provide to the  
3 network device a second request for PVC configuration information stored  
4 in the network device;

5 the physical interface means is further configured to receive a second message  
6 containing both updated PVC configuration information stored in the  
7 network device and the VPI;

8 the comparator means is further configured to compare the VPI from the second  
9 message to the first logical sub-interface number of the first logical sub-  
10 interface from the plurality of logical sub-interfaces; and

11 if the VPI from the second message matches the first logical sub-interface number  
12 of the first logical sub-interface, then cause the updated PVC  
13 configuration information from the second message to be selectively  
14 stored into the first portion of a PVC configuration information storage  
15 means that is designated for the first logical sub-interface in a manner that  
16 indicates that the updated PVC configuration information is the most

17                   recent PVC configuration information for the first logical sub-interface  
18                   received from the network device.

1    18.    The apparatus as recited in Claim 15, wherein the request generator means is  
2           further configured to:  
3           format the request for PVC configuration information stored in the network  
4           device into a request in a first format for PVC configuration information  
5           stored in the network device; and  
6           segment the request in the first format into a plurality of formatted request  
7           segments.

1    19.    The apparatus as recited in Claim 18, wherein the first format is SNMP.

1    20.    The apparatus as recited in Claim 18, wherein the first format is AAL5.

1    21.    The apparatus as recited in Claim 18, wherein at least one of the plurality of  
2           formatted request segments comprises an ATM cell.

1    22.    The apparatus as recited in Claim 15, wherein the request includes an ILMI getrequest  
2           command in SNMP format.

1    23.    The apparatus as recited in Claim 15, wherein the request includes an ILMI getnext  
2           command in SNMP format.